REMARKS

1. INTRODUCTION

Applicant and its attorneys wish to thank the Examiner for the indication of the allowable subject matter in original claims 12 to 14. In the present Response and Amendment, Applicant has amended claims 1, 4, 9, 13-15, and 17, and has added new claims 21-23. Reconsideration of the above identified application in view of the preceding amendments and following remarks is respectfully requested.

2. AMENDMENTS TO THE CLAIMS AND SPECIFICATION

Firstly, new claims 21 to 23 directed to a plate pair and a heat exchanger apparatus have been added to the application at this time to provide increased protection for the invention. It will be noted that new independent claim 21 is similar to original claim 1 except that the preamble has been changed to indicate that the plate pair is "for use in a heat exchanger". In addition, the end of the claim has been changed to indicate that the first and second openings together (form) a fastener opening for receiving a fastener for mounting purposes. It is respectfully submitted that with these changes, new claim 21 patentably distinguishes over the prior art cited by the Examiner for reasons indicated below. With respect to new claim 22, the subject matter of this claim is the same as that in original claim 12 and accordingly it is submitted that claim 22 is allowable for the same reasons as original claim 12.

With respect to new claim 23, which is specifically directed to a heat exchanger, it is respectfully submitted that this claim substantially corresponds to original dependent claim 13, a claim considered to be allowable by the Examiner. It is therefore submitted that claim 23 is allowable for the same reasons as original claim 13. The differences between claim 23 and original claim 13 are believed to be minor in nature and claim 23 avoids an inaccuracy in original claim 13. In the embodiment of the heat exchanger shown in Figures 1 to 4, only one of the two plates in which the openings are formed in fact has a peripheral edge portion with a substantially planar peripheral flange section and this is the cover plate 18. The base plate 14 as illustrated has only a central planar portion and a peripheral edge portion in which the openings 43 are formed. Thus, as indicated now in claim 23, it is the peripheral flange section of one of the

plates which is brazed by braze material to the peripheral edge portion of the other of the plates (as per the embodiment of Figures 1 to 4). Furthermore, claim 23 makes it clear that "one of said first and second openings (is) larger than the other of the first and second opening". It is clear from the original specification of this application that either the openings 41 of the first plate can be larger than the openings 43 or vice versa. In the embodiment illustrated in Figure 13 of the drawings and described in paragraph 35 of the specification, the opening 43 in the base plate 14 is larger than the opening 41 in the cover plate. However, it is also indicated near the middle of paragraph 35 in the sentence beginning "However, other shaped hole can be used in other example embodiments", that either of the openings in each aligned pair can be larger than the other in order to obtain the benefits of the invention and this is also indicated at the top of page 9 of the application. This would be readily apparent to one skilled in this art after reading the original specification and viewing the original drawings in this application.

Turning now to the amendments to the existing claims, claim 1 has been amended so that it includes a substantial portion of the subject matter of original claim 13 and it is now directed to a plate pair "for use in a heat exchanger". Both the first plate and the second plate must now have a substantially planar central portion surrounded by first and second peripheral edge portions respectively. In the case of the first plate, for example, the cover plate 18 shown in Figure 1, the peripheral edge portion must also include a substantially planar peripheral flange section with the first opening being formed in this flange section. In the case of the second plate, the second opening is formed in the second peripheral edge portion. In addition, claim 1 now requires that the braze material secure the peripheral flange section to the second peripheral edge portion of the second plate. Finally, the last clause of the claim requires that the substantially aligned first and second openings "form a mounting opening for receiving a fastener for mounting said heat exchanger". The use of a fastener in this manner is clearly illustrated in Figure 13 of the drawings and described in paragraph 35 near the middle of page 8. The illustrated fastener is a rivet 46 which extends "through an aligned pair of cover and base plate openings 43, 41 and through a further opening provided in a vehicle chassis 48."

Dependent claim 9 has been corrected by adding a period at the end of the claim. Dependent claim 13 has been amended to delete those features and items which are now redundant in this claim because they are included in claim 1.

Dependent claim 14 has been corrected since, as shown in Figure 1, the second openings 43 are not formed in a flange section of the second plate 14 but rather are formed in an edge portion of this plate.

With respect to independent method claim 15, this claim has been amended so that it includes many of the features and limitations now included in claim 1 and, for this reason, it is submitted that claim 15 is allowable over the cited references for substantially the same reasons as claim 1.

With respect to the amendments to the specification, paragraph 4 has been amended so as to provide a summary of one aspect of the invention which corresponds closely to new, broad product or apparatus claim 21. Similarly, paragraph 5 has been amended so as to provide a summary of another aspect of the invention corresponding closely to amended method claim 15. It is respectfully submitted that none of these amendments introduce any new matter into the application. All of the features and requirements added to paragraphs 4 and 5 are both shown in the original drawings of this application and described in the detailed description, namely the description of Figures 1 to 4 and Figure 13.

Paragraphs 35 and 36 are being amended at this time to replace the reference numbers 40 and 42 with new reference numbers 41 and 43 which are now used in the drawings to indicate the openings or holes in the cover plate 18 and in the base plate 14. Again, the reason for these amendments is to avoid the use of the same reference numbers to identify different features. It will be noted, for example, that reference number 40 is used to indicate the first planar side in paragraph 26 (see Figure 1), while reference number 42 is used to indicate the opposite facing side in the same paragraph.

The second last line on page 11 has been corrected by replacing the reference "80A" with – **80B** – which is the reference number that appears in Figure 16 to indicate the second V-shaped notch.

3. REJECTION OF CLAIMS 1, 2, 5, AND 6 UNDER 35 U.S.C. § 102(B)

Turning now to the specific objections raised by the Examiner in the Office action, original claims 1, 2, 5 and 6 were rejected on grounds of anticipation in view of U.S. Patent No. 5,918,664 to Torigoe. The Torigoe reference simply teaches a standard form of stacked plate evaporator. Each tube is formed by a couple of metal plates 4 that face each other and at the upper and lower ends of each plate 4 there is an upper side inlet tank portion 47 and a lower side inlet tank portion 48 having communication holes 45 and 46 respectively formed therein. With specific reference to Figure 3, a projection or lip 47A formed about the hole 45 extends snugly into a hole of similar shape formed in the adjacent plate. In this way, tank portions are formed at both the top end and the bottom end of the stack of plates 4 and refrigerant will flow through these tank portions in the indicated manner.

From this review it will be seen that amended claim1 distinguishes over the teachings of Torigoe by reciting the following features:

(1) A first plate having a peripheral edge portion including a substantially planar peripheral flange section having a first opening formed therein (In the reference, the openings 45, 46 in the plates are formed in end protruberances of the plates and not in a peripheral flange section of a peripheral edge portion);

(2) A second opening formed in a second peripheral edge portion of a second plate;

(3) Braze material must secure the peripheral flange section of one plate to the second peripheral edge portion of the second plate (In the reference, the braze material connects together expanded end sections of the plates so as to form tanks at opposite plate ends); and

(4) The substantially aligned first and second openings form a mounting opening for receiving a fastener (In the reference, the

openings 45, 46 are simply flow through openings that allow refrigerant to flow through the tank sections).

It will be appreciated by the Examiner that the openings 45, 46 in the expanded or protruding sections of the plates 4 cannot possibly be used to provide a mounting opening capable of receiving a fastener. Firstly, they are not sized to accommodate a fastener in order to mount the heat exchanger and secondly they are located internally in the fluid tanks formed by the stacked plates and thus there is no possibility of inserting any fastener through these openings. Of course, inserting any fastener in the openings 45 or 46 in the reference would be contrary to the teachings of the reference since these openings are used for refrigerant flow.

With respect to dependent claims 2, 5 and 6, it is submitted that these claims are allowable over the Torigoe reference for the same reasons as claim 1.

4. REJECTION OF CLAIMS 1-4 AND 9-11 UNDER 35 U.S.C. § 102(B)

With respect to the rejection of claims 1 to 4 and 9 to 11 on grounds of anticipation in view of U.S. Patent No. 6,227,290, it is submitted that amended claim 1 distinguishes over this reference in substantially the same manner as it distinguishes over the Torigoe reference. The '290 patent, like Torigoe, is directed to a stacked plate heat exchanger with openings formed at one end of each plate in the stack for the flow of the heat exchange fluid. The tube elements of the heat exchanger are constructed using plates of the type shown in Figures 3A to 3C. Distended portions are provided on each plate at 7 in order to form fluid flow tanks at one end. The plate shown in Figure 3C has a constricted opening at 19 for limiting the communication of fluid in tank group 16 (see column 7, lines 27 to 34). The constricted hole at 19 is aligned with a standard hole 17 of substantially larger diameter.

It will be seen from this review of the '290 patent that claim 1 distinguishes over this reference by reciting the following features:

(1) a first opening formed in a planar peripheral flange section of a peripheral edge portion of a first plate (In the reference, the opening 17, for example, is formed in distended portion 7 used to

form part of the tank and located only at one end of any planar central portion of the plate);

(2) a second opening formed in a peripheral edge portion of the second plate (If one considers the smaller opening 19 to be the second opening in the reference, then again this smaller opening is only formed in a distended section 7 used to form the tank at one end);

(3) The peripheral flange section of the first plate must be brazed to the second peripheral edge portion of the second plate;

(4) The first and second openings must form a mounting opening for receiving a fastener (In the reference, the openings 17, 19 do not and could not accommodate any fastener since they are internal openings and these openings are only intended for the flow of heat exchanger fluid.

With respect to dependent claims 2 to 4 and 9 to 11, it is submitted that these claims distinguish over the '290 patent for the same reasons as stated for claim 1.

5. REJECTION OF CLAIMS 7 AND 8 UNDER 35 U.S.C. § 103(A)

Similarly with respect to the obviousness rejection of dependent claims 7 and 8, this objection being based on the '290 patent, again it is submitted that these claims are allowable for the same reasons as stated for claim 1 on which they depend.

6. REJECTION OF CLAIM 15-19 UNDER 35 U.S.C. § 103(A)

Turning now to the obviousness rejection of original method claims 15 to 19, it is submitted that amended method claim 15 does distinguish over each of the '290 patents and the '664 patent, either alone or in combination with Inoue et al, by reciting the following features:

1. The first plate must have a peripheral edge portion which includes a substantially planar peripheral flange section in which the first opening is formed (If one considers the plate of Figure 3A in the '290 reference to be the first plate, the openings 17 at one end do not satisfy this requirement because they are formed in distended end portions of the plate and not in a planar peripheral flange section that is part of a peripheral edge portion that surrounds the central portion of the plate); and

2. The aligned first and second openings must together form "a mounting opening for receiving a fastener for mounting said heat exchanger".

With respect to the Inoue et al. reference, it will be seen that it also is directed to a laminated or stacked plate heat exchanger having a construction somewhat similar to those in the '290 and '664 references. The Examiner has simply cited this third reference on the basis of its teaching that brazing heat exchangers of this type in an oven is conventional. There is no teaching or suggestion of aligned openings being placed adjacent one another in the heat exchanger to provide a mounting opening for a fastener. As in the other references, each plate 6 has distended portions for tank formation at 8 located at one end. The openings or holes 22 formed in these distended portions appear to be of the same size (see Figure 3). Thus, there is nothing in Inoue et al. which would lead one skilled in the art to modify the stacked plate heat exchangers of either the '290 or the '664 patents in order to obtain the required mounting opening made by substantially aligned first and second openings formed in first and second plates.

7. REJECTION OF CLAIM 20 UNDER 35 U.S.C. § 103(A)

With respect to the rejection of dependent claim 20, it is submitted that this claim distinguishes over the cited combination of references for substantially the same reasons as indicated for claim 15. The additional reference to Tavi et al. simply teaches a method for forming a stacked plate heat exchanger that does not overcome the aforementioned deficiencies in the'290, '664 and '542 references.

8. NEW CLAIMS 21-23

With respect to new claim 21, it is submitted that this claim is allowable over the references cited against claim 1 in that none of the cited references teaches the required first and second openings of different size placed in substantial alignment with each other, thus forming "a fastener opening for receiving a fastener for mounting purposes". The Examiner admits in paragraph 9 on page 6 of the Office Action that the subject matter of original claim 12 was allowable because the prior art did not show a plate pair used in combination with a fastener

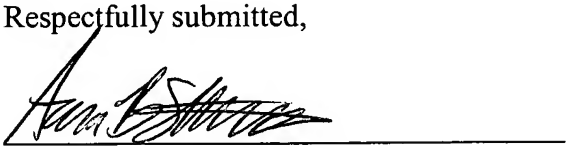
having a shaft passing through the openings in the plates. The same prior art does not teach a fastener opening for receiving a fastener, this opening being formed by substantially aligned first and second openings formed in first and second plates. As indicated above, the openings in the heat exchanger structures cited by the Examiner are not intended for fasteners but are fluid flow openings generally found in tank sections.

With respect to independent claims 23 directed to a heat exchanger, it is submitted that this claim is allowable for substantially the same reasons as indicated for original claim 13. In particular, claim 23 requires that one of the two plates have a peripheral edge portion that includes a substantially planar peripheral flange section. The first and second openings must be formed in this peripheral flange section and the peripheral edge portion of the other plate. There must also be a fastener having a shaft that passes through the first and second openings, the latter feature being the one indicated by the Examiner as rendering original claim 12 allowable (if rewritten).

9. CONCLUSION

It is respectfully submitted that all of the claims that remain in this application are in condition for allowance and such action is earnestly solicited.

Respectfully submitted,



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Date: February 17, 2005

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APPENDIX

AMENDMENTS TO THE DRAWINGS

Please replace present sheets 1 to 7 of the drawings containing Figures 1 to 17 with the set of formalized drawings containing Figures 1 to 17 attached in the Appendix.
The enclosed formalized drawings have proper formal numerals to replace the original handwritten numerals. The enclosed drawings have been prepared by a competent patent draftperson.

In addition, some minor corrections have been made to Figures 1, 2 ,5, 13 and Figures 14A to 14D and sheets of the original drawings containing these figures are enclosed in the Appendix. These sheets are marked as "ANNOTATED" to indicate the amendment made in the formal drawings.

In particular, the reference number 40 used to identify the fastener holes in the cover plate has been replaced by number – **41** – while the reference numbers "42" used to indicate the fastener holes in the plate 14 have been changed to **-- 43 --** . These changes were necessary in order to avoid the use of the same reference number to identify different features.

ANNOTATED SHEET

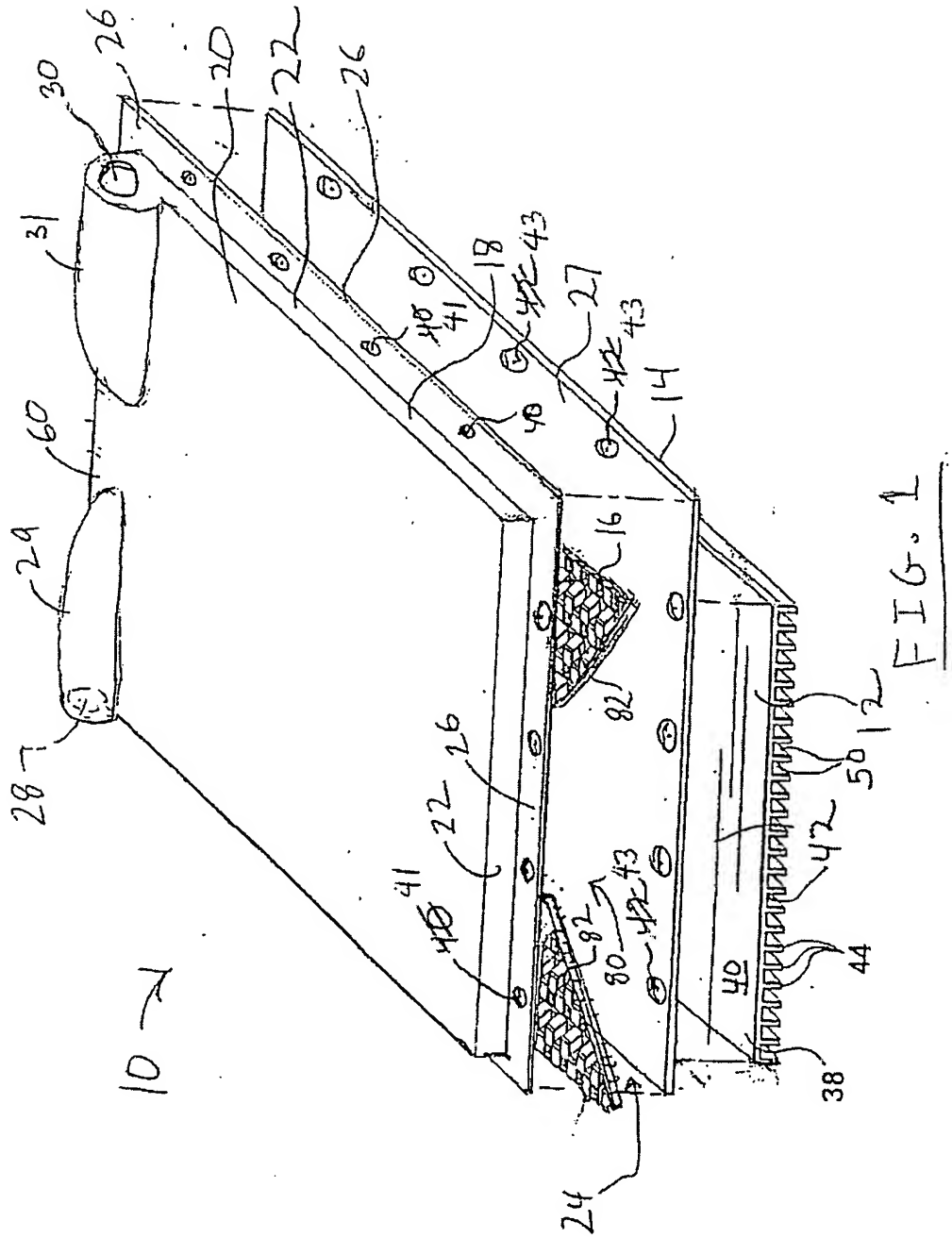

FIG. 1

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In re: Martin et al. Serial No. 10/724,436
For: BRAZED SHEETS WITH ALIGNED OPENINGS AND HEAT EXCHANGER FORMED THEREFROM

ANNOTATED SHEET

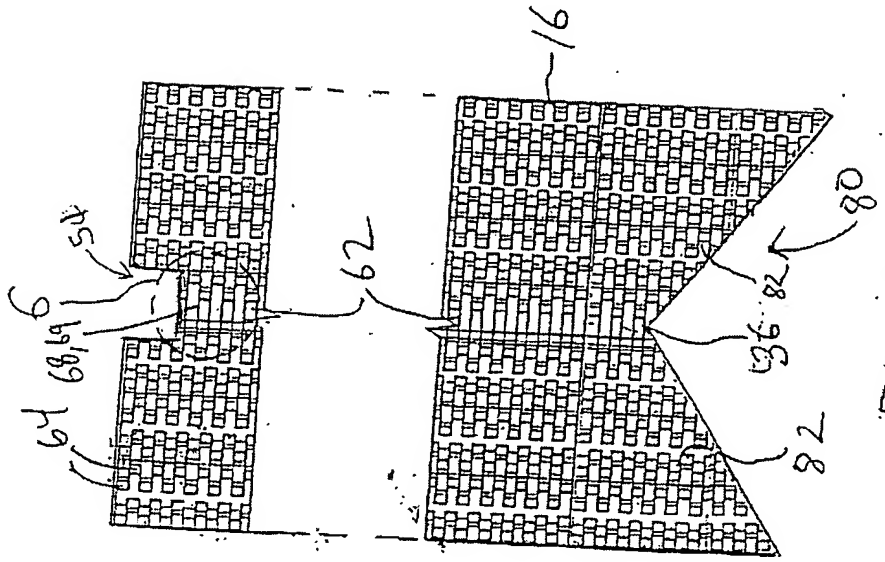

FIG. 3

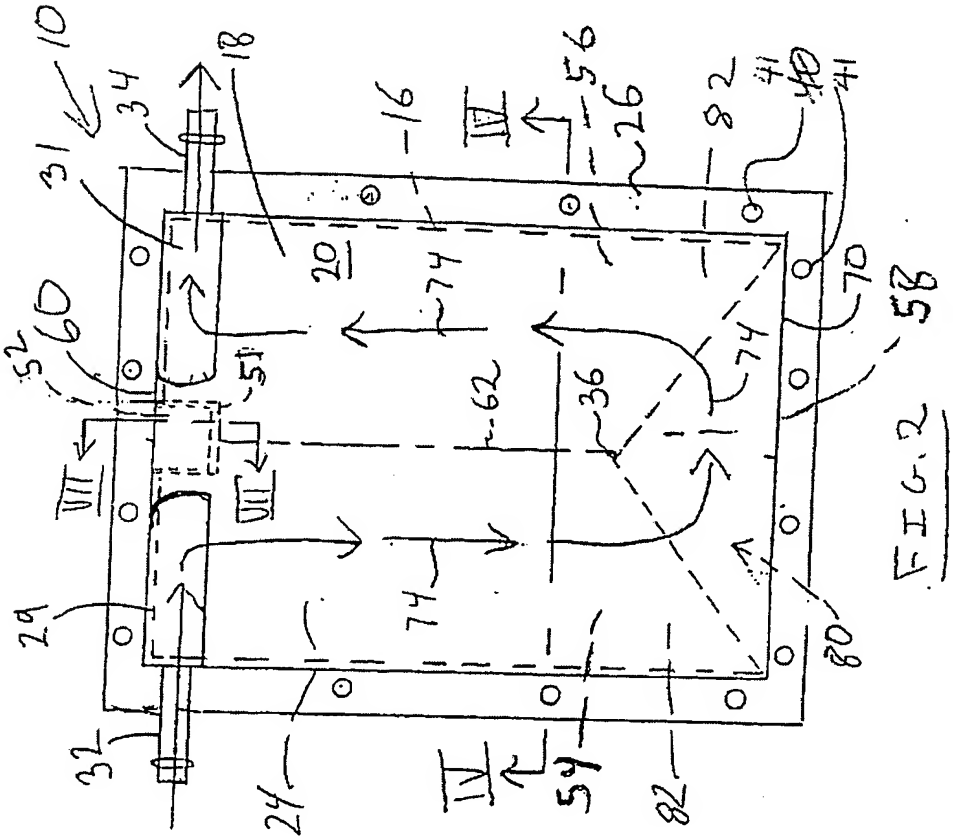

FIG. 2

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For: BRAZED SHEETS WITH ALIGNED OPENINGS AND HEAT EXCHANGER FORMED THEREFROM

ANNOTATED SHEET

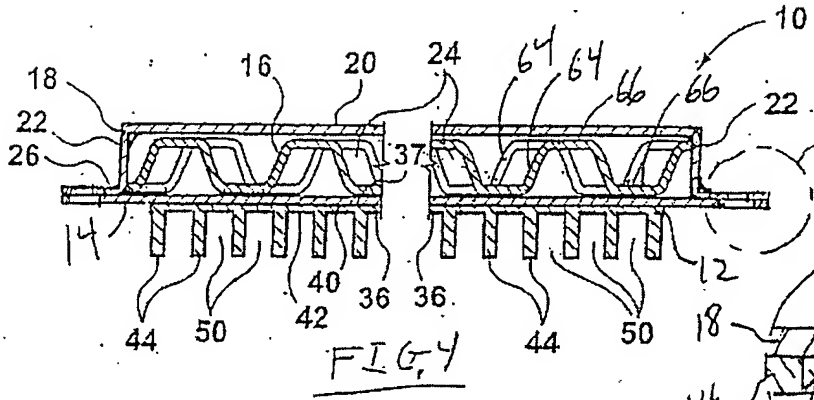

FIG. 4

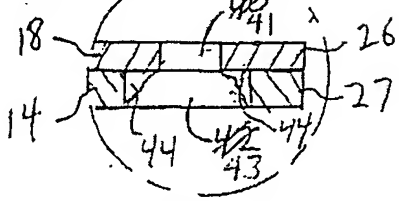

FIG. 5

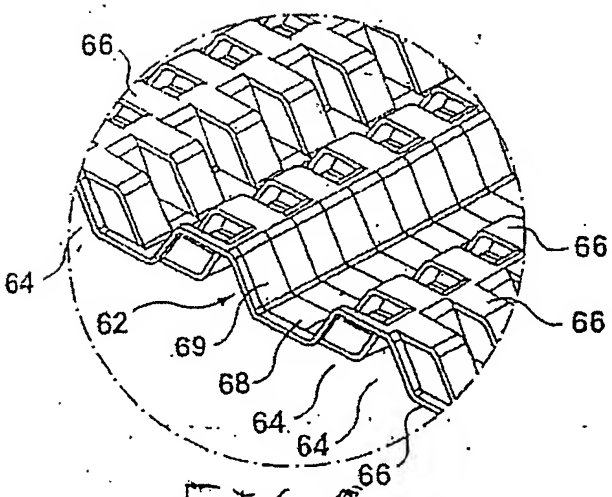

FIG. 6

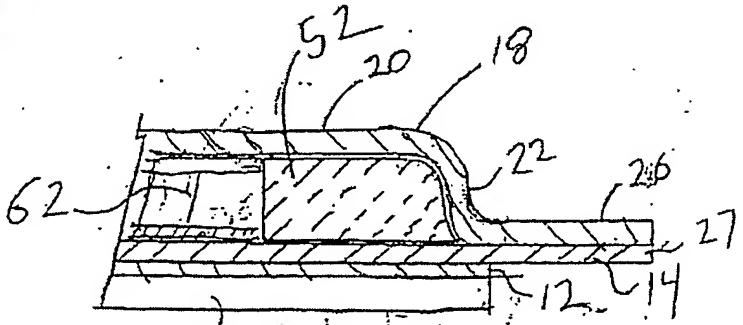

FIG. 7

In re: Martin et al. Serial No. 10/724,436
For: BRAZED SHEETS WITH ALIGNED OPENINGS AND HEAT EXCHANGER FORMED THEREFROM

ANNOTATED SHEET

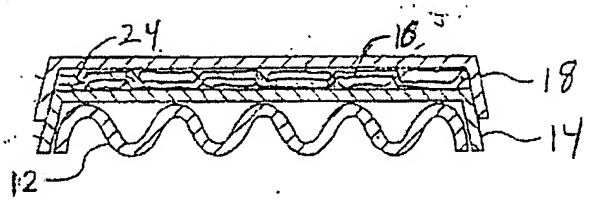

FIG. 10

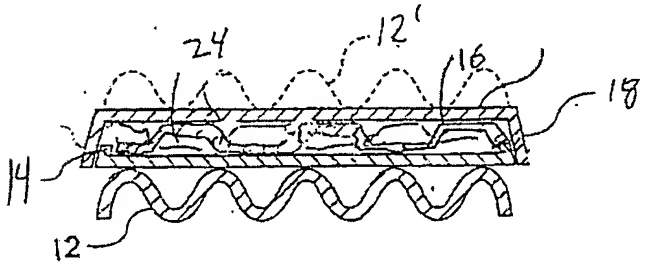

FIG. 11

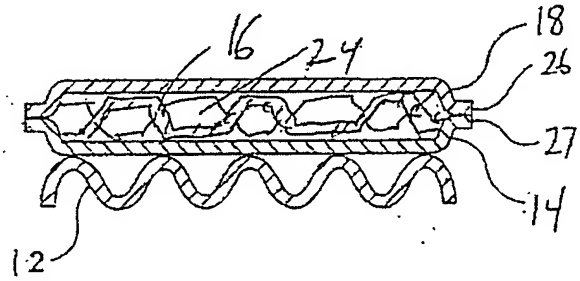

FIG. 12

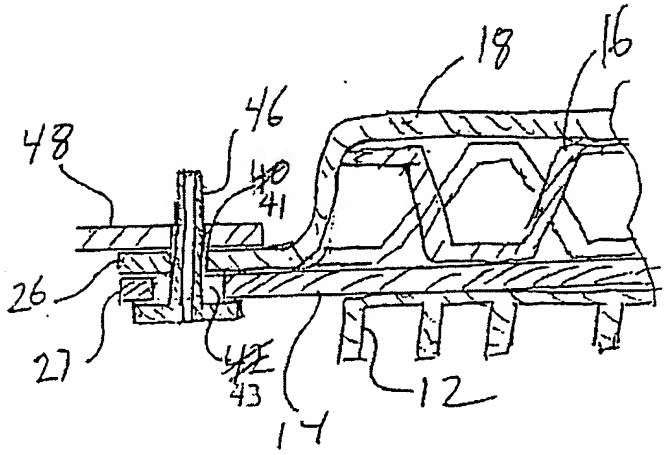

FIG. 13

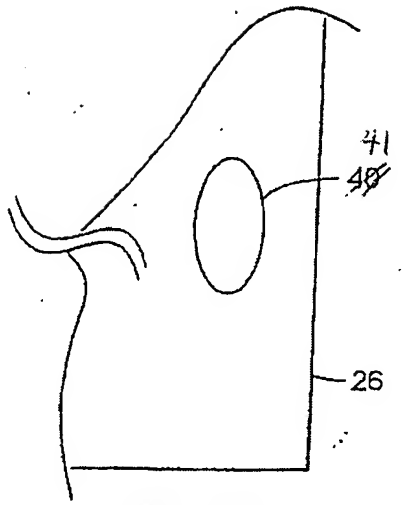

FIG. 14A

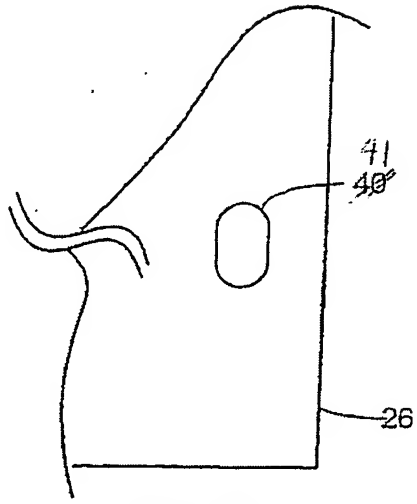

FIG. 14B

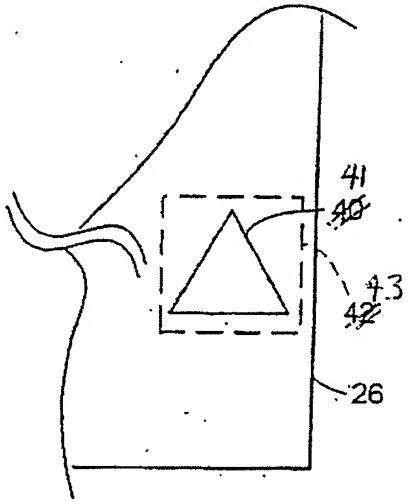

FIG. 14C

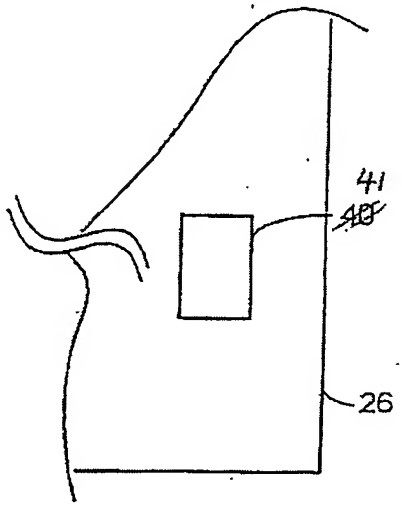

FIG. 14D